



**TRI-INSTITUTIONAL TRAINING PROGRAM IN
COMPUTATIONAL BIOLOGY & MEDICINE**

STUDENT GUIDE

EXECUTIVE DIRECTOR

Kathleen E. Pickering

PROGRAM DIRECTOR

David Christini, Ph.D.

PROGRAM COORDINATOR

Margie Hinonangan-Mendoza, M.A.

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This guide describes the organization of the Cornell University/Memorial Sloan Kettering Cancer Center/Joan and Sanford I Weill Graduate School of Medical Sciences Tri-Institutional Training Program in *Computational Biology & Medicine (CBM)*. The guide is intended to help students become familiar with the Program and conduct their studies in a productive fashion. The guide thus amounts to the current “rules” governing the Program. These rules may evolve, and this guide may be amended from time to time. It is the policy of Cornell University, including the Weill Medical College and Memorial Sloan-Kettering Cancer Center, to support the equality of educational opportunities.

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Contact Information

TRI-INSTITUTIONAL TRAINING PROGRAM OFFICE

1300 York Avenue
Room A-139, Box 194
New York NY 10065
Tel: (212) 746-5267 Fax: (212) 746-8992
www.triiprograms.org
CBM email: cbm@triiprograms.org

David Christini, Ph.D.
Program Director
Tel: (212) 746-6280
dchristi@med.cornell.edu

Kathleen E. Pickering
Executive Director
Tel: (212) 746-6049
kap2013@med.cornell.edu

Margie Hinonangan-Mendoza
Program Coordinator
Tel: (212) 746-5267
mah2036@med.cornell.edu

GRADUATE FIELD OF COMPUTATIONAL BIOLOGY

Carly Hills
Graduate Field Coordinator
1198 Comstock Hall
Cornell University
Ithaca, NY 14853
Tel: (607) 255-5488 Fax: (607) 255-4698
ctf8@cornell.edu
<http://www.cb.cornell.edu/>

WEILL GRADUATE SCHOOL OF MEDICAL SCIENCES

Weill Cornell Medical College, Olin Hall 412
445 East 69 St
New York, NY 10021
Tel: (212) 746-6565 Fax: (212) 746-8906
gsm@med.cornell.edu www.med.cornell.edu/gradschool

TRAINING PROGRAM IN COMPUTATIONAL BIOLOGY & MEDICINE **(CBM)**

INTRODUCTION

The Tri-Institutional Training Program in Computational Biology and Medicine (CBM) program brings together the exceptional educational and research resources of Cornell University in Ithaca, its Medical College in NYC (Weill Medical College of Cornell University), and Memorial Sloan-Kettering Cancer Center to provide a unique training opportunity at the forefront of computational biology and biomedical research.

The CBM program is creating a new breed of scientist, one who uses computational and analytical methods to solve complex problems in biology from the protein level to the organ level. The development of such a cadre of computational biologists will foster discovery in frontiers of basic biological and biomedical sciences.

The Tri-Institutional Training Program provides a unique opportunity for creative and motivated students to conduct research at the forefront of biomedicine and to become the scientific leaders of tomorrow.

All Tri-I CBM students receive a fellowship that provides full tuition, an annual research allocation, and a generous stipend.

PROGRAM OVERVIEW

- It is expected that students will complete their thesis research and graduate degree within six years of matriculating into the graduate program.
- Course requirements are defined by the Cornell University graduate field of Computational Biology, (details are available at www.cb.cornell.edu).
- For the remainder of this document, these course requirements will be referred to as “Computational Biology field course requirements”.
- Prior to choosing a thesis laboratory, students will be required to complete (at least) two NYC laboratory rotations and one Cornell-Ithaca laboratory rotations.
- Research in Progress seminars and journal club meetings are components of the student’s education throughout the graduate training.
- Students may choose a thesis lab in any of the Tri-Institutions after completing the required number of laboratory rotations. (Thesis

- requirements are outlined in the “Thesis and Thesis Committee requirements” section.)
- o A detailed timeline of the CBM Program can be found online at http://www.triiprograms.org/cbm/time_line.html

SELECTION OF LABORATORY ROTATIONS

Students may choose to conduct laboratory rotations with any member of the CBM Graduate Faculty. With prior written approval from the CBM Program Director, students may be permitted to perform laboratory rotations with non-CBM faculty, assuming that said faculty member has an appointment in their institution allowing them to serve as a PhD thesis advisor. In such cases, the faculty member will be contacted by the CBM Program Director prior to the commencement of the rotation to:

- (i) ensure that the rotation is appropriate, and
- (ii) assure that he/she is willing to join the CBM faculty in the event that the CBM student chooses to join their laboratory for thesis research.

Students are not permitted to rotate with faculty (CBM or otherwise) who do not have confidence that space and/or financial support are likely to be available for the student (in the event that, upon completion of the rotation, there is a mutual desire for the student to join the laboratory for his/her thesis research).

Prior to the beginning of a rotation, the student and rotation mentor must complete and submit the “CBM Lab Rotation Agreement Form” which can be downloaded at: http://www.triiprograms.org/cbm/guidelines_and_forms.html

EVALUATION OF LABORATORY ROTATIONS

Each student is expected to submit an evaluation of his/her experience in the laboratory rotation. These forms are submitted to the Tri-Institutional Training Programs Office and are kept confidential. Additionally, rotation advisors submit written reports of the student’s performance upon completion of each research rotation. The reports are forwarded to the Tri-Institutional Training Programs Office. Evaluation forms can be found online at: http://www.triiprograms.org/cbm/guidelines_and_forms.html

A or ACE EXAM:

All students will write and defend a thesis proposal to satisfy the requirements of the A or ACE exam. This exam will consist of (i) a written **thesis proposal** and (ii) an oral presentation describing the components of the proposed thesis defense. The composition of the examining committee and the exam rules (with

the exception of the stipulation that CBM student exams are a thesis proposal, whereas the exam rules may state otherwise) must adhere to the standards set by the graduate program/field in which the student is aligned (typically that which the student's thesis mentor is a member, e.g., WGSMS Physiology, Biophysics, and Systems Biology [PBSB] program). In particular:

- Students in Ithaca are aligned with the Graduate Field of Computational Biology and should therefore work with the Graduate Field of Computational Biology coordinator to ensure that all Field requirements are followed.
- Students in NYC whose mentor is a member of the PBSB program should follow the PBSB rules (see “Admission to Candidacy Exam Guide” at <http://pbsb.med.cornell.edu/students/index.php>) and get Program Director approvals/sign-off from the PBSB Program Director. The ACE committee is required to have 4 faculty members – 3 WGSMS faculty (one of whom will serve as the committee chair) and 1 CU-I faculty.
- Students in NYC whose mentor is not a member of the PBSB program will follow the PBSB rules (see “Admission to Candidacy Exam Guide” at <http://pbsb.med.cornell.edu/students/index.php>) and get Program Director approvals/sign-off from the CBM Program Director. The ACE committee is required to have 4 faculty members – 3 WGSMS faculty (one of whom will serve as the committee chair) and 1 CU-I faculty.

Upon successful completion of the A/ACE examination, the examination committee should be instructed by the student to submit the written report on the results of the examination to the Tri-Institutional Training Programs Office (NYC students) or the Computational Biology Field office (Ithaca students), which will file the report in the student’s CBM file and send a copy of the report to the Graduate School in which the student is matriculated.

Forms related to the ACE examination, thesis committee, and final examination can be found online at:

http://www.triiprograms.org/cbm/guidelines_and_forms.html

THESIS and THESIS COMMITTEE REQUIREMENTS

Students may choose a thesis mentor from the CBM Graduate Faculty on any of the campuses. With prior written approval of the CBM Program Director, a student may be permitted to do their thesis research in the laboratory of a faculty

member who is not yet on the CBM roster (see "SELECTION OF LABORATORY ROTATIONS"), provided that the faculty member joins the CBM faculty.

The composition of the thesis committee must be in line with the guidelines of the graduate program in which the student is matriculated. Additionally, each student must have at least one member of the thesis committee who is a computational biologist, and at least one member from the remote campus (i.e., an Ithaca faculty member for students at WCMC/SKI, or a NYC member for students at CU-I). For NYC students, the thesis committee is required to have 4 faculty members – 3 WGSMS faculty (one of whom will serve as the committee chair) and 1 CU-I faculty.

Students must meet with their Thesis Committee AT LEAST once each year between the defense of their A exam and the defense of their thesis. Students are required to bring the evaluation form used by their institution (e.g., "Student Evaluation Form" at WGSMS) to the meeting. The committee will fill out this form, thereby providing a written evaluation of the student's progress. The form must then be filed with both the Tri-Institutional Training Program Office and the Graduate School in which the student is matriculated. Although not required, it is recommended that students meet with their thesis committee every 6 months, to keep the committee up to date and to get their input/feedback on thesis direction.

Forms related to the ACE examination, thesis committee, and final examination can be found online at:

http://www.triiprograms.org/cbm/guidelines_and_forms.html

GENERAL EXPECTATIONS FOR CBM GRADUATE STUDENTS

ACADEMIC STANDING AND EVALUATION OF STUDENT PROGRESS

Students are expected to maintain good academic standing during the course of their participation in the CBM program. Academic standing will be determined by the policies and procedures of the graduate school in which the student is matriculated. It is expected that CBM students will, at a minimum:

- Achieve grades of B or better in all coursework;
- Successfully complete all laboratory rotations;
- Successfully complete the Admission to Candidacy Examination (“A” or “ACE” Exam);
- Demonstrate adequate progress in thesis research project;
- Successfully complete a thesis defense and submit a written thesis in accordance with the policies and procedures of the graduate school in which the student is matriculated;
- Participate in any required Research in Progress Seminars, journal club meetings, student symposiums, annual meetings (with completion of annual report form) with Program Director, and other activities required by the CBM Program;
- Abide by the policies and procedures of the Tri-I CBM program and the graduate school in which they are matriculated;
- Complete all required forms (e.g., all end-of-rotation evaluation forms) and submit to the CBM program office.

Failure to maintain good academic standing may lead to revocation of the student’s annual research allocation, placement on academic probation, or dismissal from the graduate program. Placing a student on academic probation and/or dismissing a student from the program will be governed by the policies and procedures of the graduate school in which the student is matriculated and will be done in consultation and with the approval of the CBM Program Director.

GUIDELINES GOVERNING SCIENTIFIC MISCONDUCT

INTRODUCTION AND DEFINITION

Truth, integrity and credibility are critical and distinctive principles of any educational/research institution. Adherence to these principles is essential for the efficient progress of scientific research and to preserve the trust of the public in the research community. The maintenance of accepted standards in research based on these principles is highly regarded by the scientific community and is a major responsibility of CU-I, WMC, and MSKCC. Consequently these institutions must set standards and procedures for their members in order to preserve the truth, integrity and credibility in research to prevent scientific misconduct, and to deal efficiently and fairly with allegations or other indications of scientific misconduct.

Scientific misconduct is generally defined as an act that violates the standards of integrity in the conduct of scholarly research or communication. Such acts include, but are not limited to:

- Plagiarism – the representation of words or ideas of others as one’s own; more subtle practices include misleading or inadequate reference citation and duplicate publication of identical data without adequate reference;
- Falsification of Data – direct fabrication of results, misrepresentation of methods, or deliberate omission of conflicting data with intent to deceive;
- Forgery of Scientific Documents;
- Abuse of confidentiality – misuse of confidential information or failure to maintain the confidentiality of such information, e.g., “stealing” of information obtained through review of research proposals, manuscripts, etc.;
- Aiding or facilitating acts of academic dishonesty by others;
- Violation of pertinent Federal or institutional regulations and ethical codes, e.g., those involving protection of human subjects and the welfare of laboratory animals;

- Other practices that seriously deviate from those that are commonly accepted in the scientific community for proposing, conducting or reporting research;
- Breaches of scientific integrity other than those enumerated above;

Honest error or honest differences in interpretation or judgment of data are not regarded as scientific misconduct.

GUIDING PRINCIPLES FOR PRESERVING RESEARCH INTEGRITY

The administration, faculty, students and other academic or non-academic staff all share in the responsibility for preserving research integrity and preventing scientific misconduct. This policy applies for all such individuals associated with the Tri-Institutional Training Programs and within the participating institutions. Together they must create an atmosphere that promotes high ethical standards and fosters honest research. Within this framework, it is the institutions' obligation to establish standards and responsibilities for their members and to hold those members accountable for transgression of these regulations. Accordingly, the institutions consider violation of the tenets described above under "Introduction and Definitions" to represent a major breach of contract between the faculty, student or staff member and the institutions.

RESPONSIBILITIES OF FACULTY, STUDENTS AND STAFF

- Faculty, students and staff through appropriate and timely openness of research should foster intellectual honesty. Upholding intellectual honesty is the responsibility of all institutional members, especially the scientific leaders and laboratory directors and faculty. These individuals must set the example by maintaining the highest ethical standards, encouraging open communication within and amongst laboratories and laboratory workers, and instituting procedures for self-regulation and peer review of ongoing research. Faculty, students and staff are urged to discuss research ethics to heighten awareness and recognition of these issues.
- Faculty, laboratory directors and scientific leaders must accept special responsibility for the appropriate supervision and teaching of other staff and students, and in the final analysis, must assume responsibility for the validity of all research communications emanating from their laboratories.

- Carefully recorded experimental protocols and methods are strong deterrents to research misconduct. It is the responsibility of the researcher to ensure that records are maintained to document adequately the work performed.
- Faculty, staff and students should insist on the appropriate accreditation of authorship for their own work and should cite appropriate references to research performed outside their laboratories. The contributions of other investigators should be appropriately acknowledged in all scientific publications. Authorship should be attributed only to those individuals who have contributed significantly to the research, have reviewed the manuscript critically and who are prepared to support the validity of the data presented.
- The faculty, students and staff, as members of the scientific community should report any incident of scientific misconduct which they believe to have occurred, or any allegations of scientific misconduct which are brought to their attention.

PRODECURES - Any allegations of scientific misconduct pertaining to a student will be managed in accordance with the policies and procedures of the institution at which the student is matriculated. Allegation(s) of scientific misconduct pertaining to a staff or faculty member will be managed in accordance with the policies and procedures of the employing institution. Students and faculty of the Tri-Institutional Training Programs are expected to familiarize themselves with the appropriate institution's policies and procedures governing scientific misconduct.